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PATENT TRADEMARK OFFICE

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1 This application is submitted in the name of the following inventor(s):

2

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9 business at 3400 Hillview Avenue, Building #5, 1st Floor, Palo Alto, California 94304.

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16 Title of the Invention

17 Asynchronous Out-Of-Band Delivery of Embedded Media Objects

18 BACKGROUND OF THE INVENTION

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20 Field of the Invention

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22 This invention relates to delivery of embedded media objects.

## 1    Related Art

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3            In computer communication networks, one method of communication is  
4    email (“electronic mail”), in which a sending user prepares and sends a message to a re-  
5    ceiving user. Email is well suited to relatively short messages, such as text. However,  
6    when the sending user wishes to send a relatively larger amount of information, such as a  
7    media document (one example of a media document is a video clip), known email sys-  
8    tems are subject to several drawbacks.

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16            A first drawback of known email systems is that a media document can be  
17    larger than the maximum size of messages for which the email system is designed. For  
18    example, some known email systems are unable to deliver messages longer than about  
19    500 kilobytes in size, while many media documents can be several megabytes in size.

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22            A second drawback of known email systems is that a relatively large media  
23    document can take a correspondingly large amount of time (and other resources) to de-  
24    liver from the sending user to the receiving user. In known email systems, delivery and  
25    presentation of the media document to the receiving user is triggered by the receiving  
26    user’s email client device. The receiving user might therefore be forced to wait a substan-  
27    tial time for the media document to be delivered and be available for presentation.  
28    Moreover, if a number of receiving users all attempt to access media documents at sub-

1 stantially the same time, an email server for those receiving users can become overloaded,  
2 thus degrading the receiving users' experience further.

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4 Accordingly it would be desirable to have a technique for delivery of em-  
5 bedded media objects, such as for example media documents, that is not subject to draw-  
6 backs of the known art.

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8 These advantages and others are provided in an embodiment of the inven-  
9 tion, described herein, including a technique in which media documents and other rela-  
10 tively larger documents can be delivered from a sender to a recipient and presented to the  
11 recipient with reduced use of time and other resources.

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## SUMMARY OF THE INVENTION

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14 The invention provides a method and system for delivering relatively large  
15 documents (such as for example media documents) with reduced use of time and other  
16 resources. Relatively large documents sent by a sender to a recipient in an email message  
17 are delivered separately from the email message, asynchronously from delivery of the  
18 email message or its presentation to the recipient, and using an out-of-band technique  
19 separate from email message delivery. As shown below, this provides for relatively rapid  
20 and reliable delivery of the email message, separate reliable delivery of the media docu-  
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1 ment, and presentation of the media document to the recipient without further sending  
2 delay.

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4 In a first aspect of the invention, a sender gateway is coupled to the sender.  
5 The sender gateway replaces the media document in the email message with a link, and  
6 caches that media document for delivery to the recipient using an out-of-band (non-email)  
7 technique, such as the FTP or HTTP protocols. The sender gateway delivers the media  
8 document to the recipient asynchronously from delivering the email message to the re-  
9 cipient, using one of several possible techniques: (1) scheduling delivery of the media  
10 document separately from delivery of the email message, (2) delivering the media docu-  
11 ment in response to a separate request message from the recipient, or some combination  
12 thereof.

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14 In a second aspect of the invention, a recipient gateway is coupled to the  
15 recipient. The recipient gateway cooperates with the sender gateway in providing asyn-  
16 chronous, out-of-band delivery of the media document. In cooperation with the sender  
17 gateway, the recipient gateway can receive the media document using an out-of-band  
18 technique, such as the FTP or HTTP protocols, and reassociate that media document with  
19 the email message. In cooperation with the sender gateway, the recipient gateway can:  
20 (1) schedule receipt of the media document separately from receipt of the email message,  
21 (2) request delivery of the media document in response to the email message from the

1 sender, (3) cache the media document in anticipation of presenting that media document  
2 to the recipient, or some combination thereof.

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4 The invention has general applicability to sending and receiving relatively  
5 larger documents (including without limitation, media documents, attached documents,  
6 and the like) in association with relatively short messages (including without limitation  
7 email, “instant messaging,” and the like). There is no particular limitation of the invention  
8 specifically to media documents or to email messages, nor is the invention necessarily  
9 related to the specific applications disclosed herein.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a block diagram of a system for asynchronous out-of-band delivery of embedded media objects.

Figure 2 shows a process flow diagram for asynchronous out-of-band delivery of embedded media objects.

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#### 19 DESCRIPTION OF THE PREFERRED EMBODIMENT

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21 The invention is described herein with regard to preferred steps and data  
22 structures. Those skilled in the art will recognize, after perusal of this application, that the

1 described steps and data structures are not limited to any particular circuits. Rather, those  
2 of ordinary skill in the art would be able to implement the described steps and data struc-  
3 tures, and equivalents thereof, without undue experimentation or further invention. All  
4 such implementations are within the scope and spirit of the invention.

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6 **Related Applications**

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8 Inventions described herein can be used in conjunction with inventions de-  
9 scribed in the following documents:

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15 U.S. Patent Application Serial No. 09/680,541, Express Mail Mailing No. EL 524 780  
16 772 US, filed October 4, 2000, in the name of Wei Yen et al., attorney docket number  
17 196.1001.01, titled "Replacement of Requested Data with Equivalent Data".

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22 U.S. Patent Application Serial No. 09/684,384, Express Mail Mailing No. EL 524 780  
23 582 US, filed October 4, 2000, in the name of Wei Yen et al., attorney docket number  
24 196.1002.01, titled "Adaptive Predictive Delivery of Information".

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29 U.S. Patent Application Serial No. 09/732,519, Express Mail Mailing No. EL 524 780  
30 335 US, filed December 6, 2000, in the name of Raymond Lo et al., attorney docket num-  
31 ber 196.1003.01, titled "A Trusted Gateway Device Serving Multiple Clients Providing  
32 Content Storage, Management and Delivery".

1           These documents are hereby incorporated by reference as if fully set forth  
2   herein. These documents are referred to as the “incorporated disclosures”.

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4   Lexicography

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6           The following terms refer or relate to aspects of the invention as described  
7   below. The descriptions of general meanings of these terms are not intended to be limit-  
8   ing, only illustrative.

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10          out-of-band – In general, a technique or mode of operation different from that which is  
11           normally used. For example, where an email may normally be used to  
12           transfer data; data may be transferred using File Transfer Protocol (FTP).  
13           In this case FTP is an out-of-band technique.

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16          As noted above, these descriptions of general meanings of these terms are  
17           not intended to be limiting, only illustrative. Other and further applications of the inven-  
18           tion, including extensions of these terms and concepts, would be clear to those of ordinary  
19           skill in the art after perusing this application. These other and further applications are  
20           part of the scope and spirit of the invention, and would be clear to those of ordinary skill  
21           in the art, without further invention or undue experimentation.

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## 1    System Elements

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3            Figure 1 shows a block diagram of a system for asynchronous out-of-band  
4    delivery of embedded media objects.

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6            A system 100 includes a sender 110, a sender gateway 120, a communica-  
7    tions network 130, a recipient gateway 140, a recipient 150, and an application service  
8    provider 160.9  
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1516            The sender 110, includes a processor, program and data memory, mass stor-  
17    age, an input device, an interface device capable of coupling with a communications link  
18    115, and program software. The sender 110 preferably includes a personal computer or  
19    similar device. The program software enables the sender 110 to perform the function of  
20    exchanging data with external devices.

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22            The communications link 115 operates to couple the sender 110 and all  
23    other devices either directly or indirectly to the communications network 130.

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25            A sender gateway 120 includes a processor, program and data memory,  
26    mass storage, an interface device capable of coupling with the communications link 115,  
27    and program software. A gateway is a network point that acts as an entrance to another  
28    network. The sender gateway 120 operates to provide an entrance (“gateway”) from the

1 network of the sender 110 to other networks, such as the network of the recipient 150.  
2 Gateways are known in the art.

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4 In a preferred embodiment, the sender 110 and the sender gateway 120 are  
5 separate devices, however, in alternative embodiments the sender 110 and the sender  
6 gateway 120 may be the same device. Moreover, in further alternative embodiments the  
7 sender 110 (and sender gateway 120, if any) can be the same device as the recipient 150  
8 (and recipient gateway 140, if any).

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A communications network 130 includes at least a portion of a communication network, such as a LAN, a WAN, the Internet, an intranet, an extranet, a virtual private network, a virtual switched network, or some combination thereof. In a preferred embodiment, the communication network 130 includes a packet switched network such as the Internet, as well as (in addition to or instead of) the communication networks just noted, or any other set of communication networks that enable the elements described herein to perform the functions described herein.

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18 The recipient gateway 140, similar to the sender gateway 120, includes a  
19 processor, program and data memory, mass storage, an interface device capable of coupling  
20 with the communications link 115, and program software. The recipient gateway 140  
21 operates to provide an entrance (“gateway”) from the network of the recipient 150 to  
22 other networks, such as the network of the sender 110.

1           As noted above, although the sender gateway 120 and the recipient gateway  
2 140 are shown as separate devices, there is no requirement that they are separate devices.  
3           In an alternative embodiment, the sender gateway 120 and the recipient gateway may be  
4 the same device.

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6           The sender gateway 120 and the recipient gateway 140 are optional ele-  
7 ments of the system 100. In alternative embodiments, the system 100 may be configured  
8 with either the sender gateway 120, the recipient gateway 140, both or neither. In em-  
9 bodiments where the sender gateway 120 is not present, the sender 110, the recipient  
10 gateway 140, the ASP 160 or some combination may provide its functions. In embodi-  
11 ments where the recipient gateway 140 is not present, the recipient 150, the sender gate-  
12 way 120, the ASP 160 or some combination may provide its functions.

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          The recipient 150 includes a processor, program and data memory, mass  
storage, an input device, an interface device capable of coupling with a communications  
link 115, and program software. The recipient 150 preferably includes a personal com-  
puter or similar device. The program software enables the recipient 110 to perform the  
function of exchanging data with external devices.

          In a preferred embodiment, the recipient 150 and the recipient gateway 140  
are separate devices, however, in an alternative embodiment the recipient 150 and the re-  
cipient gateway 140 may be the same device.

1 An application service provider 160 includes a processor, program and data  
2 memory, mass storage, an interface device capable of coupling with the communications  
3 link 115, and program software. The application service provider (ASP) 160 operates to  
4 provide specialized applications remotely located to the user that would be expensive to  
5 install and maintain within their own company or on their own computer. Application  
6 Service Providers are known in the art.

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8 In a preferred embodiment, a media object 111 includes an electronic data  
9 file in a media format such as MPEG2. Media objects are known in the art. An email  
10 112 includes electronic data in a file. Electronic mail (e-mail) is known in the art.

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12 System Operation

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15 Figure 2 shows a process flow diagram for asynchronous out-of-band delivery of embedded media objects.

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17 A method 200 is performed by the system 100. Although the method 200 is  
18 described serially, the steps of the method 200 can be performed by separate elements in  
19 conjunction or in parallel, whether asynchronously, in a pipelined manner, or otherwise.  
20 Similarly, although the method 200 is described as being performed by separate elements,  
21 these separate elements can be combined. Lastly, there is no particular requirement that

1 the method 200 be performed in the same order in which this description lists the steps,  
2 except where so indicated.

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4 At a flow point 210, the system 100 is ready to begin performing a method  
5 200.

6

7 At a step 220, the sender 110 initiates an email 112 with a media object 111  
8 attached. The sender 110 composes an email 112 addressed to the recipient 150 and at-  
9 taches a media object 111 to the email 112. Generally, this is achieved using an email  
10 program such as Microsoft Outlook or Netscape Navigator.

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1 have to wait long from the time that the email 112 is sent. The email 112 is delivered  
2 quickly. Using the current state of the art, the recipient 150 would have to wait an ex-  
3 traordinary amount of time while the email 112 and the large attached media object 111  
4 are delivered together.

5

6 At a step 250, the media object 111 is delivered asynchronously from the  
7 email 112 to a location close to the recipient 150, such as the recipient gateway 140, the  
8 recipient 150 itself, or a relatively nearby caching server. This delivery may be triggered  
9 automatically by the sender 110, sender gateway 120, recipient gateway 140, recipient  
10 150, or ASP 160 depending on the elements present in the system 100 as detailed in the  
11 alternative embodiments herein.

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18 When the recipient 150 chooses to view the media object 111, the object is  
19 transferred from its relatively close cached location to the recipient 150. Since the cached  
20 location is functionally closer to the recipient 150 than the sender 110, and the network  
21 connecting the recipient 150 and the cached location can potentially be much higher  
22 speed, the final transfer of the media object 111 is relatively fast.

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24 At a step 260 the email 112 has been delivered, and at the discretion of the  
25 recipient 150 the media object 111 and email 112 have been viewed.

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27 At this step the method 200 has completed and may be repeated.

## 1    System Configurations

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3            The invention is flexible with regard to its implementation. In a preferred  
4   embodiment the system 100 includes all the elements illustrated in figure 1 except the  
5   ASP 160. As previously mentioned, the sender gateway 120 and the recipient gateway  
6   140 may also be optional. In alternative embodiments, the system 100 includes the core  
7   elements of a sender 110, media object 111, email 112, communications network 120, and  
8   recipient 150. In addition to these elements, an alternative embodiment may use any  
9   combination of the sender gateway 120, recipient gateway 140, and ASP 160.

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16            In a first alternative embodiment an ASP 160 is used. The email 112 and  
17   media object 111 are sent to the ASP 160. The ASP 160 strips the media object 111 from  
18   the email 112 and delivers the email to the recipient 150. The media object 111 is then  
19   delivered using an out-of-band transfer technique to a location relatively local to the re-  
20   cipient 150. This location may be a caching server in the network, the recipient gateway  
21   140, or the recipient 150.

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23            In a second alternative embodiment no sender gateway 120 or ASP 160 is  
24   used. The sender 110 initiates an email 112 with an attached media object 111. The  
25   email 112 is delivered through the standard e-mail delivery process with an embedded  
26   link to the media object 111 and the media object 111 is delivered out-of-band to a loca-  
27   tion close to the recipient 140.

1           In a third alternative embodiment the sender 110 or sender gateway 120  
2    may send a probing signal to one or both of the recipient 150 and ASP 160 to determine  
3    the best method of delivery. For example, the probe may determine whether there is an  
4    intermediate location where the media object 111 may be cached close to the recipient  
5    gateway 140, recipient 150, or ASP 160. The probe may also be used to detect the trans-  
6    fer protocol and media object 111 format preferred by the recipient 150. The sender 110  
7    or sender gateway 120 may then reformat the media object 111 and use the suggested  
8    protocol and route to deliver the media object 111.

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In a fourth alternative embodiment the recipient gateway 140 checks received email 112 automatically on a regular basis for any links to media objects 111 embedded in the email 112. Thus, it may pre-cache any links contained in the email 112.

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In a fifth alternative embodiment the sender gateway 140 separates the media object 111 from the email 112, caches the media object 111 locally, and inserts a link into the email 112 through which the media object 111 may be accessed. This allows the recipient 150 or any intermediate device (such as, the recipient gateway 140 or ASP 160) to access the media object 111 on demand once the email 112 has been received.

## 1 Generality of the Invention

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3 The invention has general applicability to sending and receiving relatively  
4 large documents in association with relatively short messages.

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